424 Rec'd PCT/PTO 21 JUL 2000

FORM PTO-1390 (REV. 5-93) | U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE | ATTORNEY'S DOCKET NUMBER 67190/983037

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

U.S. APPLICATION NO. (If known, see 37 CFR 1.5): 09/600827

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/DE99/00079	(15.01.99) 15 January 1999	(23.01.98) 23 January 1998

TITLE OF INVENTION
ELECTRICAL TRANSMISSION

APPLICANT(S) FOR DO/EO/US
SCHMIDT, Manfred; HOLL, Eugen and FETZER, Jürgen

Applicants herewith submit to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) immediately rather than delay applicable time limit set in 35 U.S.C. examination until the expiration of the 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 b. ☒ has been transmitted by the International Bureau.
 c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 b. ☐ have been transmitted by the International Bureau.
 c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). (Unsigned)
10. ☒ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
 ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information: International Search Report and International Preliminary Examination Report.

Express Mail No.: EL302700785

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APPLICATION NO. if known, see 37 CFR 1.5	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
09/600827	PCT/DE99/00079	67190/983037

1. ☒ The following fees are submitted:	CALCULATIONS	PTO USE ONLY
Basic National Fee (37 CFR 1.492(a)(1)-(5)):		
Search Report has been prepared by the EPO or JPO $840.00		
International preliminary examination fee paid to USPTO (37 CFR 1.482) ... $670.00		
No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) $760.00		
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO $970.00		
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) $96.00		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$ 840	
Surcharge of $130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$	

Claims	Number Filed	Number Extra	Rate		
Total Claims	2 - 20 =	0	X $18.00	$ 0	
Independent Claims	1 - 3 =	0	X $78.00	$ 0	
Multiple dependent claim(s) (if applicable)			+ $260.00	$	
TOTAL OF ABOVE CALCULATIONS =				$ 840	
Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28).				$	
SUBTOTAL =				$ 840	
Processing fee of $130.00 for furnishing the English translation later the ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f)). +				$	
TOTAL NATIONAL FEE =				$ 840	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). $40.00 per property +				$	
TOTAL FEES ENCLOSED =				$ 840	
				Amount to be: refunded	$
				charged	$

a. ☐ A check in the amount of $_____ to cover the above fees is enclosed.

b. ☒ Please charge my Deposit Account No. 11-0600 in the amount of **$840.00** to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to 11-0600. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) Deposit Account No. or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Richard L. Mayer
SIGNATURE

Kenyon & Kenyon
One Broadway
New York, New York 10004

Richard L. Mayer, Reg. No. 22,490
NAME

7/21/00
DATE

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[67190/983037]

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s)	:	SCHMIDT et al.
Serial No.	:	To Be Assigned
Filed	:	Herewith
For	:	ELECTRICAL TRANSMISSION
Examiner	:	To Be Assigned
Group Art Unit	:	To Be Assigned

Assistant Commissioner
for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

SIR:

Please amend the above-identified application before examination as follows:

In The Specification:

On page 1, line 1, change "Background Information" to --Background Information--.

On page 1, line 15, delete "according to the definition of the species of Claim 1".

On page 1, line 16, after "Patent" insert --No.--, and delete "C2".

On page 1, line 21, change "Application 1710345A" to --No.1,710,345--.

On page 1, line 25, insert --Summary Of The Invention--.

On page 1, line 26, change "The" to --An--.

On page 2, delete lines 3 and 4.

On page 2, delete lines 6-18 and insert the following:

--The electrical transmission according to the present invention has two generators coupled to the output shaft of an internal combustion engine via a step-up reduction gear operating as a transfer case. The electrical transmission according to the present invention includes the following additional features:

- two electrical traction motors arranged next to one another are arranged underneath the generators;
- a step-down reduction gear is arranged downstream from the electrical traction motors as a summator gear train; and
- the step-up transmission is integrated in the connecting flange between the internal combustion engine and the generator.--.

On page 2, lines 28-29, change "Claim 1" to --the present invention--.

On page 3, line 3, after "German" insert --Published--, after "Application" insert --No.--, and delete "A1".

On page 3, line 11, change "Claim 2" to --the present invention--.

On page 3, delete lines 14-20, and insert the following:

--Brief Description Of The Drawings

Figure 1 shows a top view of an electrical transmission according to the present invention.

Figure 2 shows a bottom view an electrical transmission according to Figure 1.

Detailed Description--.

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On page 4, delete lines 3 and 4, and insert the following:

--As a comparison between Figures 1 and 2 shows, both electrical traction motors 8 and 9 are located underneath generators 1 and 2.--.

On page 5, line 1, change "Claims" to
--What Is Claimed Is:--.

In The Claims:

Please cancel original claims 1 and 2, without prejudice, and please cancel substitute claim 1, without prejudice. Please enter the following new claims.

3. (New) An electrical transmission, comprising:

a step-up reduction gear operating as a transfer case;

a first generator coupled to an output shaft of an internal combustion engine via the step-up reduction gear;

a second generator coupled to the output shaft of the internal combustion engine via the step-up reduction gear;

a first electrical traction motor arranged underneath the first generator and the second generator;

a second electrical traction motor arranged next to the first electrical traction motor and underneath the first generator and the second generator;

a step-down reduction gear arranged downstream from the first electrical traction motor and the second electrical traction motor as a summator gear train; and

a connecting flange, the step-up reduction gear being integrated in the connecting flange between the internal combustion engine and the first generator and the second generator.

4. (New) The electrical transmission according to claim 3, wherein:

the step-up reduction gear is designed as a gear transmission.

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In The Abstract:

Delete line 19.

Remarks

This Preliminary Amendment cancels original claims 1 and 2 and cancels substitute claim 1, without prejudice, in the underlying PCT Application No. PCT/DE99/00079. This Preliminary Amendment also adds new claims 3 and 4. The new claims do not add new matter to the application, but do conform the claims to U.S. Patent and Trademark Office rules.

The amendments to the specification and abstract are to conform the specification and abstract to U.S. Patent and Trademark Office rules. The amendments to the specification and abstract do not introduce new matter into the application.

The underlying PCT application includes a Search Report dated June 4, 1999, and an International Preliminary Examination Report dated May 26, 2000, copies of which are submitted herewith.

Applicants assert that the present invention is new, non-obvious, and useful. Consideration and allowance of the claims are requested.

Respectfully submitted,

KENYON & KENYON

Dated: 7/21/00

By: _____
Richard L. Mayer
Reg. No. 22,490

One Broadway
New York, NY 10004
(212) 425-7200

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09600827 - 090800

In The Abstract:

Delete line 19.

Remarks

This Preliminary Amendment cancels original claims 1 and 2 and cancels substitute claim 1, without prejudice, in the underlying PCT Application No. PCT/DE99/00079. This Preliminary Amendment also adds new claims 3 and 4. The new claims do not add new matter to the application, but do conform the claims to U.S. Patent and Trademark Office rules.

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The underlying PCT application includes a Search Report dated June 4, 1999, and an International Preliminary Examination Report dated May 26, 2000, copies of which are submitted herewith.

Applicants assert that the present invention is new, non-obvious, and useful. Consideration and allowance of the claims are requested.

Respectfully submitted,

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[67190/983037]

ELECTRICAL TRANSMISSION

Description

The present invention relates to an electrical transmission having two generators which are coupled to the output shaft of an internal combustion engine via a step-up reduction gear operating as a transfer case.

In motor vehicles powered by an internal combustion engine the drive energy output by the internal combustion engine is initially transmitted to a differential transmission via a conventional automatic transmission and therefrom to the drive shaft.

In view of the increasingly strict emission regulations, it may become necessary for these vehicles, for example, city buses powered by internal combustion engines, to reduce harmful emissions.

An electrical transmission according to the definition of the species of Claim 1 is described in German Patent 43 22 676 C2. The known electrical transmission has two generators coupled to the output shaft of an internal combustion engine via a step-up reduction gear acting as a transfer case. The step-up reduction gear is designed as a belt reduction gear, and the internal combustion engine transmits its drive power via a differential transmission.

Furthermore, U.S. Patent Application 17 10 345 A describes a motor vehicle in which two electrical traction motors are supplied with current from a generator referred to as a dynamo. Each traction motor is connected to a wheel to be driven via its own cardan shaft and its own differential.

The object of the present invention is to provide an electrical transmission having a compact design which can be substituted, in a simple manner, for an existing automatic transmission

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in vehicles powered by internal combustion engines.

This object is achieved according to the present invention through the features of Claim 1. One advantageous embodiment of the present invention is described in Claim 2.

The electrical transmission according to Claim 1 has two generators coupled to the output shaft of an internal combustion engine via a step-up reduction gear operating as a transfer case. The electrical transmission according to Claim 1 includes, according to the present invention, the following additional features:

- the generators are arranged next to one another;
- two electrical traction motors arranged next to one another are arranged underneath or behind the generators;
- a step-down reduction gear is arranged downstream from the electrical traction motors as a summator gear train;
- the step-up transmission is integrated in a connecting flange between the internal combustion engine and the generators and;
- the dimensions of the electrical transmission are adapted to those of an automatic transmission to be replaced.

The electrical transmission according to the present invention has a compact design and can be substituted for an existing automatic transmission in a simple manner.

The electrical transmission according to the present invention thus allows existing vehicles powered by an internal combustion engine, in particular city buses powered by a diesel mechanical drive, to be inexpensively retrofitted by replacing the existing automatic transmission with the electrical transmission.

By replacing the automatic transmission with the electrical transmission according to Claim 1, a city bus powered by a diesel electric drive is obtained in a simple manner. Compared to city buses powered by a diesel mechanical drive, such a city bus has a lower fuel consumption and considerably lower emission values, since the internal combustion engine can be operated in the optimum rpm range and its rpm is controlled continuously via the electrical traction motor. In conjunction with energy storage devices such as, for example, a

battery, fuel cell, or flywheel storage device, a low-emission or even an emission-free bus (hybrid bus) is obtained. The advantages of such hybrid vehicles are described, for example, in German Patent Application 41 33 013 A1.

Electrical transmissions according to the present invention may have a redundant power supply, since each generator can be activated via independent power electronics (rectifiers or converters). In addition, optimum adjustment to the required or desired drive power can be achieved in a simple manner. Furthermore, the individual generators can be driven with optimum efficiency by selectively turning at least one generator on or off.

In an embodiment according to Claim 2, the step-up reduction gear is designed as a gear transmission.

The invention is described in the following with reference to an embodiment schematically illustrated in the drawing.

Figure 1 shows a top view of an electrical transmission according to the present invention;

Figure 2 shows a bottom view an electrical transmission according to Figure 1.

Figures 1 and 2 show a first generator 1 and a second generator 2 which are coupled to a step-up reduction gear 5 via their generator shafts 3 and 4. Step-up reduction gear 5 is designed as a common transfer case and it is also coupled to a shaft 6 of an internal combustion engine 7.

The housings of generators 1 and 2 are connected to the housing of internal combustion engine 7 in a non-positive manner via a connecting flange 11.

According to the present invention, transfer case 5 is integrated in connecting flange 11.

The electrical energy generated by generators 1 and 2 is supplied to two electrical traction motors 8 and 9.

Both electrical traction motors 8 and 9 output the mechanical drive power generated via a

step-down reduction gear 10, which is designed as a common summator gear train.

As Figures 1 and 2 show, both electrical traction motors 8 and 9 are located below and behind generators 1 and 2.

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Patent Claims

1. An electrical transmission having two generators (1, 2) which are coupled to the output shaft of an internal combustion engine (7) via a step-up reduction gear (5) operating as a transfer case,
characterized by the following features:
- the generators (1, 2) are arranged next to one another;
- two electrical traction motors (8, 9) arranged next to one another are arranged underneath and behind the generators (1, 2);
- a step-down reduction gear (10) is arranged downstream from the electrical traction motors (8, 9) as a summator gear train;
- the step-up reduction gear (5) is integrated in the connecting flange (11) between the internal combustion engine (7) and the generators (1, 2), and
- the dimensions of the electrical transmission are adapted to those of an automatic transmission to be replaced.

2. The electrical transmission according to Claim 1, characterized by the following features:
- the step-up reduction gear (5) is designed as a gear transmission.

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Abstract

An electrical transmission having two generators (1,2) which are coupled to the output shaft of an internal combustion engine (7) via a step-up reduction gear (5) operating as a transfer case, is characterized by the following features:

- the generators (1, 2) are arranged next to one another;
- two electrical traction motors (8, 9) arranged next to one another are arranged underneath or behind the generators (1, 2);
- a step-down reduction gear (10) is arranged downstream from the electrical traction motors (8, 9) as a summator gear train;
- the step-up reduction gear (5) is integrated in connecting flange (11) between the internal combustion engine (7) and the generators (1, 2) and;
- the dimensions of the electrical transmission are adapted to an automatic transmission to be replaced.

The electrical transmission has a compact design and and can replace, in a simple manner, existing automatic transmissions in vehicles powered by an internal combustion engine.

Fig. 1

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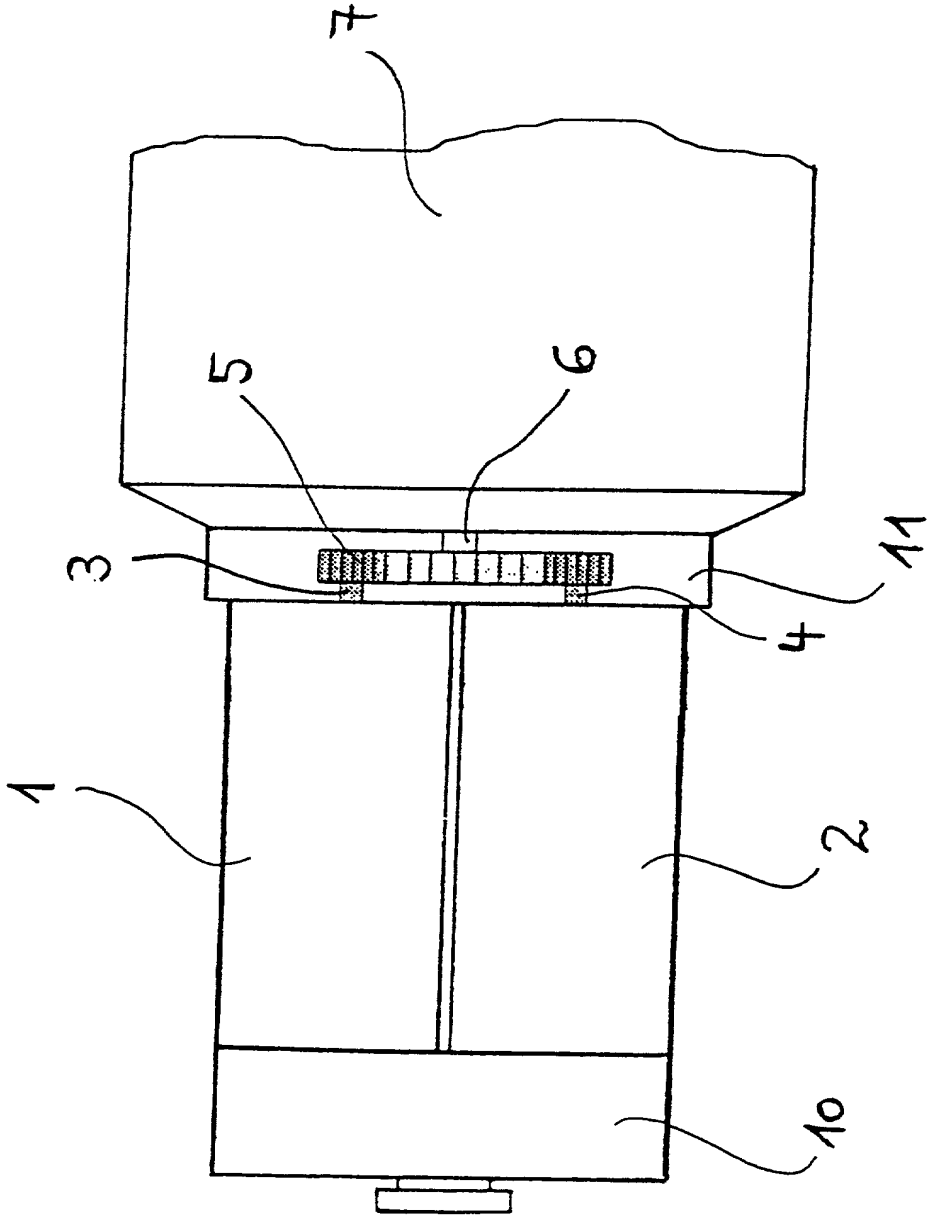


FIG 1

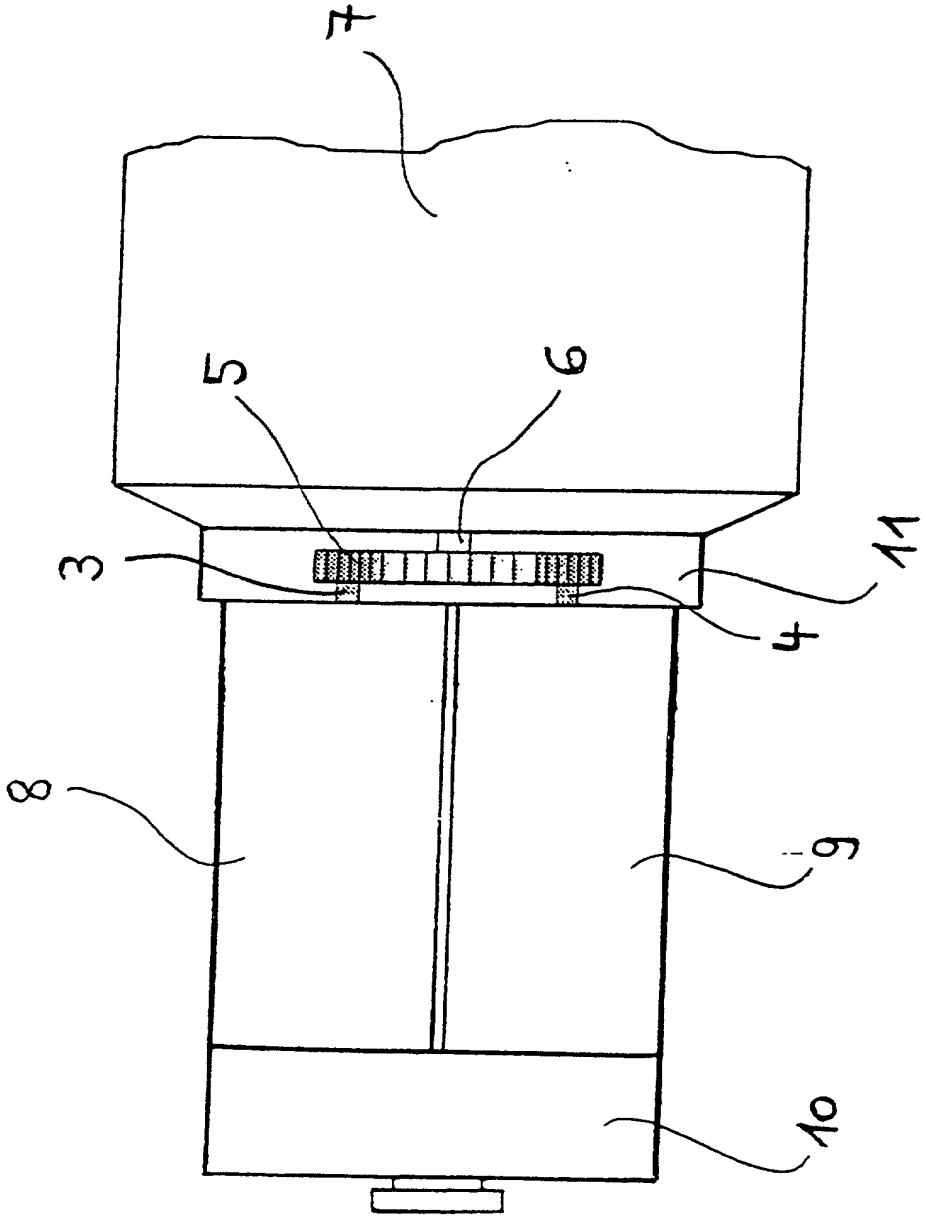


FIG 2

[67190/983037]

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled **ELECTRICAL TRANSMISSION,** for which an application for Letters Patent was filed as PCT Application No. **PCT/DE99/00079** on **January 15, 1999**.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application(s) for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

PRIOR FOREIGN APPLICATION(S)

Number	Country	Day/month/year filed	Priority Claimed Under 35 USC §119
198 02 549.1	Germany	23 January 1998	YES

EL946074534S

And I hereby appoint Richard L. Mayer (Reg. No. 22,490), Gerard A. Messina (Reg. No. 35,952), and Michelle M. Carniaux (Reg. No. 36,098) my attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

Please address all communications regarding this application to:

KENYON & KENYON
One Broadway
New York, New York 10004

Please direct all telephone calls to Richard L. Mayer at (212) 425-7200.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful and false statements may jeopardize the validity of the application or any patent issued thereon.

Inventor: Manfred SCHMIDT

Inventor's Signature: _____

Date: Aug 9, 2005

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Citizenship: Federal Republic of Germany

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DOCKET NO. 2003P50969US

2-10

Inventor: Eugen HOLL

Inventor's Signature: _____

Date: Aug. 10, 2000

Residence: Mecklenburger Str.14
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Federal Republic of Germany

Citizenship: Federal Republic of Germany

Post Office Address: Same as above.

09/636,290 - 08/10/00

Inventor: Jürgen FETZER

Inventor's Signature: [signature]

Date: 09.08.2000

Residence: Dompropststr. 39
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Federal Republic of Germany DE

Citizenship: Federal Republic of Germany

Post Office Address: Same as above.

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